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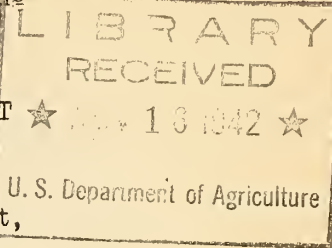
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UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
and
Bureau of Agricultural Chemistry and Engineering

ACE. 90

THE GINNERS' PART IN COTTON-QUALITY IMPROVEMENT



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(Paper presented by the Senior Author before a meeting of the Oklahoma Cotton Ginnners' Association, Oklahoma City, Okla., April 25, 1941)

The services which you cotton ginnners perform are indispensable to the cotton industry. Cotton must be ginned before it can be utilized in industry. The cotton gin is one of the greatest contributions to the development of America's agriculture, commerce, and industry and to the art of living for all American people. Professor John T. Wheeler, University of Georgia, writing in Contributions of Leading Americans to Agriculture, states that Whitney's cotton gin brought into being not only the most extensive type of farming in America, but also great industrial expansions as well. According to figures presented by Professor Wheeler, 3,125,000 persons were employed in 1935 in occupations directly dependent upon the cotton gin, not including those engaged in transporting cotton. It was estimated that these persons so employed supported almost 15 million people. Over 2 million farmers supported 11 million individuals; three quarters of a million people in the textile industry supported 3 million individuals; 90,000 employed in cotton gins in a season supported 360,000 individuals; 20,000 employed in compresses and warehouses supported 80,000 individuals; 20,000 in the raw-cotton trade supported 80,000 individuals; and 30,000 in seed crushing and oil refining supported 120,000 individuals. So it is no wonder that you cotton ginnners are realizing more and more each year the tremendous responsibility you have in the welfare of our cotton industry. This is demonstrated forcibly by your presence here today for the purpose of considering your problems, and bringing together information basic to a solution of them and the performance of better service to cotton producers.

The ginnners of Oklahoma and other cotton-producing States are playing an important part and will, no doubt, continue to do so on an even larger scale in the organized efforts now being made to improve the quality and spinning value of American cotton. Cotton ginnners are assuming this responsibility not only to protect their own interests but to promote the well-being of their customers--the cotton producers,--upon whose success the ginnners' prosperity ultimately depends.

The Ginnners' Contributions in Cotton Quality Improvement

It is evident that ginnners can play a vital part in cotton-improvement programs. They can give the grower improved service not only by adequately equipping their gins, maintaining all parts of their outfits in good condition

and using the machinery correctly, but by encouraging their farmer customers to plant good cotton, use improved harvesting methods, and exercise more care in handling the cotton on the farm. Both ginner and farmers find it to their advantage to keep themselves informed in regard to performance of cotton varieties in State and Federal Experiment Station tests with respect to yield, turnout, and quality. Of special interest and importance to ginner, also, may be the "ginnability," or ginning characteristic of different varieties of cotton in terms of ease of handling, power, and time requirements per bale.

The ginner in your State have done much to induce farmers to plant improved varieties of cotton, and they have assisted materially in the organization of one-variety communities and Smith-Doxey groups. These cotton-improvement groups are organized for the purpose, among other things, of producing a single variety of cotton, in order that the length, uniformity, and quality of the fibers may be improved; of obtaining marketing advantages by producing regular quantities of uniform fiber; of maintaining conditions necessary for the increase of stocks of superior planting seed; and of encouraging better preparation of cotton for market by the adoption of better harvesting and handling practices and improved ginning methods.

During 1940, there were 97 active one-variety communities in 36 counties in the State of Oklahoma composed of 16,236 members who produced 194,632 bales on 446,600 acres 1/. In this connection, more than 200 ginner in Oklahoma cooperated last year with the organized groups of cotton producers that obtained free classing service from the U. S. Department of Agriculture under the Smith-Doxey Act. More than 132,000 samples were submitted for classification. It was mutually agreed by all parties concerned that the cooperating ginner would use their gin machinery exclusively for the ginning of the cotton produced by the farmers' organization, or that they would set aside certain days for such ginning, and that they would clean thoroughly all machinery before using it. This was done in an effort to maintain the purity of the seed. The ginner also agreed to repair, adjust, and otherwise put their gins in proper condition and to use every precaution necessary with respect to adjustments of gin machinery and in properly handling the cotton in the gins so that the quality of lint and seed of each and every bale would be preserved. In addition, many of the ginner assumed the responsibility as group leaders.

The group leader's responsibilities included explaining to members ways and means of using the classification and market news data for making the service a profitable venture. These had to do with keeping the farmers informed about cotton that is reduced in grade because of poor ginning resulting from careless harvesting and handling methods. Showing a comparison of prices paid for cotton harvested under different conditions is an example of how the importance of careful harvesting could be emphasized. The ginner-leaders handled the details incident to drawing, identifying, and shipping the samples. They also could assist in making the classification data useful in selling the cotton, and in encouraging local buyers to recognize it in arriving at prices.

1/ This information was supplied through the courtesy of Roy W. Ellithorp, U. S. Bureau of Plant Industry and Oklahoma Agricultural Experiment Station.

In addition to the cooperation of ginnermen in the cotton classing service, as stated, cooperation of many Oklahoma ginnermen has been extended to the U. S. Department of Agriculture by furnishing for classification samples from all their ginnings. Upon this information, the Department bases its estimate of grade and staple length of cotton produced in Oklahoma. These ginnermen make available to their patrons the classification data obtained under this cooperative arrangement.

Status of Cotton Gin Modernization

Along with being helpful to producers in selecting improved varieties of cotton for production on an organized basis, in encouraging better harvesting and handling methods, and in aiding producers to determine the value of cotton, Oklahoma ginnermen have realized in recent years that their primary responsibility to cotton producers is to keep their gins up-to-date and thus to render a better ginning service to their patrons. In some instances, and particularly those wherein ginning volume has been sufficient to make the ginning business a profitable enterprise, very good progress has been made in cotton gin repair and maintenance, or modernization, in Oklahoma. However, surveys made in 1940 by the U. S. Cotton Ginning Laboratory in 52 fairly representative Oklahoma gins, indicated that there was still room for improvement in the physical condition of many Oklahoma gins.

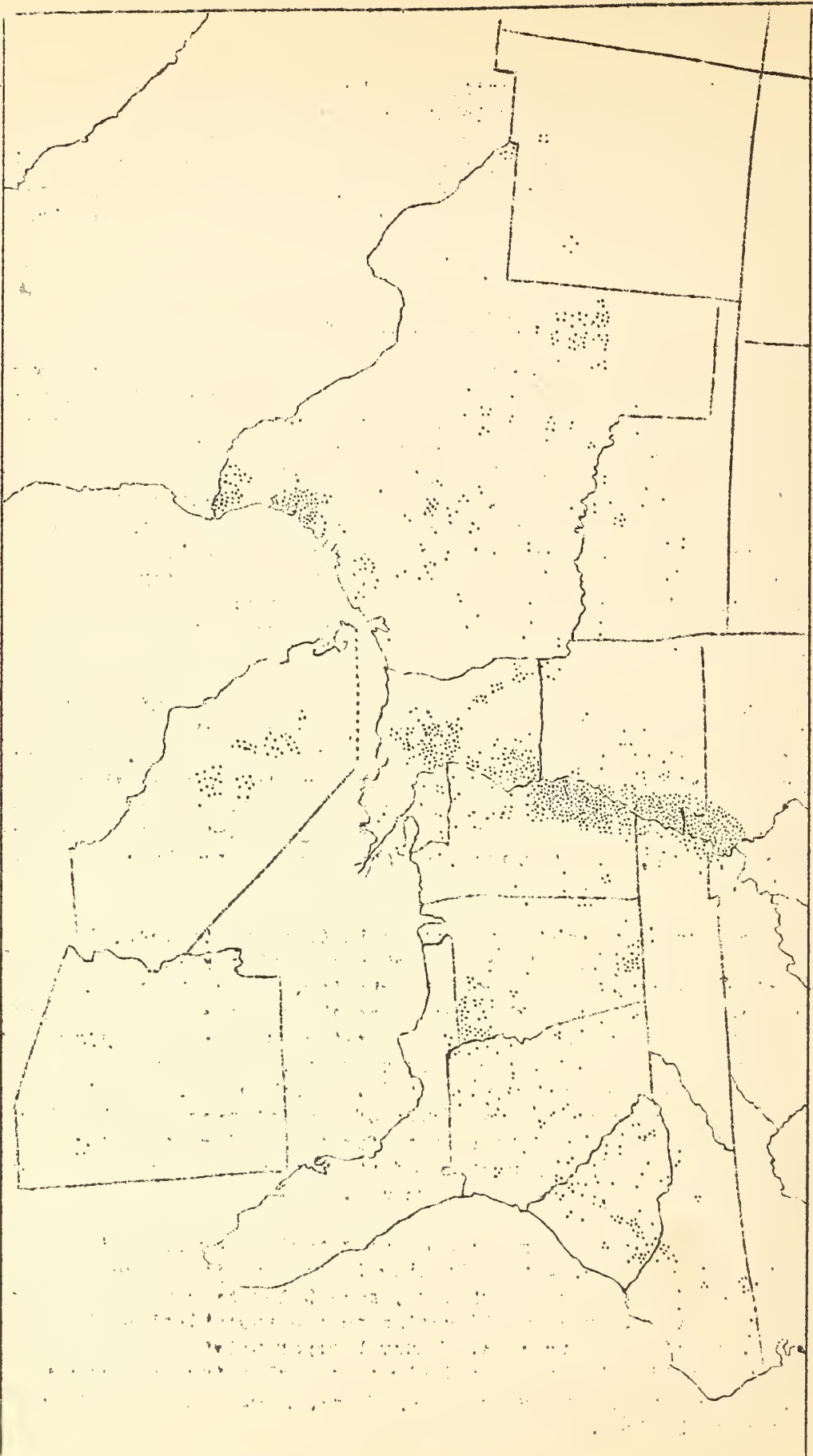
In general, the gins were found to be adequately equipped to perform a satisfactory job of cleaning and extracting, although there appeared to be some opportunity for advantageous simplification of these systems. The number of seed cotton driers in operation in 1940 was more than double that of the number in 1939 (fig. 1). Reports from the users of these driers indicate that very beneficial results are being obtained by the use of driers in conditioning and cleaning green, damp, or wet cotton, and in cleaning trashy cotton picked in a dry condition.

In our survey of drying operations in Oklahoma in 1940, it was found that an average of 77 percent of the cotton ginned by 55 percent of drier-equipped gins reporting was conditioned prior to ginning. These reports showed average ginning capacity increases of 20 percent on the moist cotton and about 2 percent on the dry cotton, increases which were attributed to the handling of the seed cotton through the conditioning and drying units. Based on these reports, bale value was increased an average of about \$2.25 with green, damp, or wet cotton and 65 cents with dry cotton as a result of conditioning and cleaning the cotton and improving its grade. The fuel costs for the different heating units averaged 14 cents per bale. Ninety percent of the driers used steam as a source of heat, and the remainder, gas-fired furnaces.

In the light of these reports on practical drier operations and laboratory findings of the U. S. Cotton Ginning Laboratory that agree for the most part with those reported by the ginnermen, more Oklahoma ginnermen undoubtedly may be expected to give further consideration to the installation of drying equipment or attachments in their gins. Unusual opportunities exist in Oklahoma gins for economical application of heated air to the cleaning and extracting machinery, especially in the steam-powered plants, where, by use of exhaust steam, the heat would be virtually free.

U. S. Cotton Ginning Laboratory, Stoneville, Miss.

LOCATION OF COTTON GINS EQUIPPED WITH COTTON DRIERS IN THE UNITED STATES, SEASON 1940-41



United States, 1340; Alabama, 83; Arizona, 11; Arkansas, 156; California, 56; Florida, 3; Georgia, 59; Illinois, 2; Kentucky, 4; Louisiana, 181; Mississippi, 223; Missouri, 128; New Mexico, 8; North Carolina, 32; Oklahoma, 22; South Carolina, 72; Tennessee, 29; Texas, 270; and Virginia, 1.

In order to provide first-class ginning and at the same time preserve the staple length of the farmers' cotton and meet cotton spinners' quality requirements, ginners already operating driers, or those contemplating new installations in Oklahoma gins, should remember that driers require close attention during operation, particularly in reference to the regulation of the heat. The reports from the drier operators in the Cotton Belt showed that some operators were employing drying air temperatures that were too high in relation to the moisture content of the cotton to adequately preserve the staple length of the cotton. In this connection, the drying temperature should not exceed 160° F. for the usual run of damp or wet cotton. A slightly higher temperature can be used with very wet cotton, but, under no circumstances, should it exceed 200° F.

There appears to be a trend in Oklahoma toward the installation of extractor-cleaner feeders in lieu of big drum feeders, along with simplification of overhead cleaning and extracting machinery. Of the 52 gins surveyed by the laboratory, however, over one-third used big drum-cleaning feeders in place of extractor-cleaner feeders, and depended entirely upon overhead extracting machinery for removing burs and large particles of foreign matter from roughly harvested cotton. Also, these gins were equipped with overhead cleaners having an average of 11 cleaning cylinders. Almost one-third of the gins studied were equipped with extractor-cleaner feeders and overhead cleaners having an average of 9 cleaning cylinders. One-fourth of the gins used these feeders and cleaners along with overhead extractors.

The increased production of longer staple cotton in one-variety communities and elsewhere in the State has been a factor responsible for the increased interest in providing more suitable cleaning, extracting, and drying facilities in Oklahoma gins. These provisions are being made because the longer cottons are harder to clean and more difficult to gin when brought to the gin in a green and damp condition than are the shorter cottons and, therefore, require more appropriate and effective equipment for processing it.

Other Developments Involved in Cotton Ginning Quality and Efficiency

In a further effort to provide smoother ginning, especially with the longer staple cottons, many Oklahoma ginners replaced or thoroughly reconditioned their gin saws in 1940. This was the case in over 16 percent of the gins examined by the laboratory. Furthermore, it was found that the ginning ribs in 10 percent of these gins were reconditioned or replaced as were the brushes in 8 percent of the brush gins studied. As a result of the improvements made in the condition of gin saws, only 5 percent were found to be in poor condition. A majority of the gins had good ginning ribs, but at least one-fourth of them had ribs that were considered as being in only fair condition. One out of 12 of the brush gins needed extensive brush repairs.

The average saw speed of the gins tested in Oklahoma was about the same as that for more than 500 gins checked by the laboratory in the various cotton producing States in 1940. The saws in 9 percent of the gins studied across the Cotton Belt were increased for an average of 102 revolutions per minute, or from 440 to 542 revolutions per minute, in an effort to provide looser seed roll and smoother and more efficient ginning. In our studies in Oklahoma, however, no evidence of saw speed increases were noted for 1940. Data compiled from the

Cotton Belt studies of seed-roll density and gin-saw speed in 500 commercial gins show a direct relationship between these two factors--the percentage of gins operating with loose seed rolls increasing gradually with definite increases in their gin-saw speed (fig. 2). Only 42 percent of the gins operating with saws in the speed range of 450 revolutions per minute and below, employed loose seed rolls, as compared with 87 percent of those running at speeds above 650 revolutions per minute. Moreover, the average ginning time for a bale of cotton was only 63 minutes per gin stand at the high speed range as compared with 82 minutes at the low speed range.

In our surveys in Oklahoma, it was found that the saws in over half of the gins were being operated at a speed of 500 revolutions per minute or below, and that therefore there are unusually good possibilities for obtaining better ginning in Oklahoma by increasing the saw speed of slow-speed gins. This practice is being rapidly and profitably adopted in the Mississippi Valley States. The regional gin surveys revealed that the Oklahoma ginners were employing denser seed rolls than ginners in some of the other areas, and that better ginning could be performed if more attention were given to this important factor of gins. Less than one-third of the gins studied were employing loose seed rolls at the time of the laboratory inspection, while only 12 percent of the gins were operating with tight seed rolls. In the case of the remaining 58 percent found to be using medium seed rolls, slightly slower feeding of the cotton to the gin stands, or increased speed of the gin saws of the slow-speed gins would have provided smoother ginning, especially with long staple cotton. Tight seed rolls constantly produce roughly ginned lint, even with dry, short staple cottons.

In laboratory tests at Stoneville, a modernized gin, having new saws running at a speed of 600 revolutions per minute, and a new brush and extractor-cleaner feeder properly operated, gave outstanding better capacity, turnout, and quality than the twin gin of the same design which was not rebuilt, and which employed a plain drum feeder and was operated with saws in poor condition at 400 revolutions per minute, and with a brush that had not been reconditioned. Modernization decreased ginning time 30 percent and increased lint turnout over 1 percent. When the two gins were operated at the same capacity, the seed roll of the unmodernized gin tightened up, and caused rougher ginning preparation than did the modernized gins.

Conclusion

Before closing, one other fact should be emphasized. It is this: No matter how extensive your gin modernization efforts may be, no cleaning, extracting, and drying machinery now in use is effective enough in its action to put roughly harvested, wet cotton in a condition to gin out a sample equal in quality to that ginned from seed cotton carefully and cleanly picked in a dry condition, and ginned after handling with ordinary cleaning and feeding equipment. The Oklahoma State Cotton Improvement Specialist, Mr. R. W. Ellithorp, who is present at your meeting today, faces this problem in his work, and consequently he has been working with Oklahoma producers in an effort to improve cotton harvesting and handling methods in one-variety cotton communities. As you know, he and Mr. W. H. McPheters, Extension Agricultural Engineer, also of the Oklahoma Agricultural Extension Service, are very much interested in obtaining better ginning

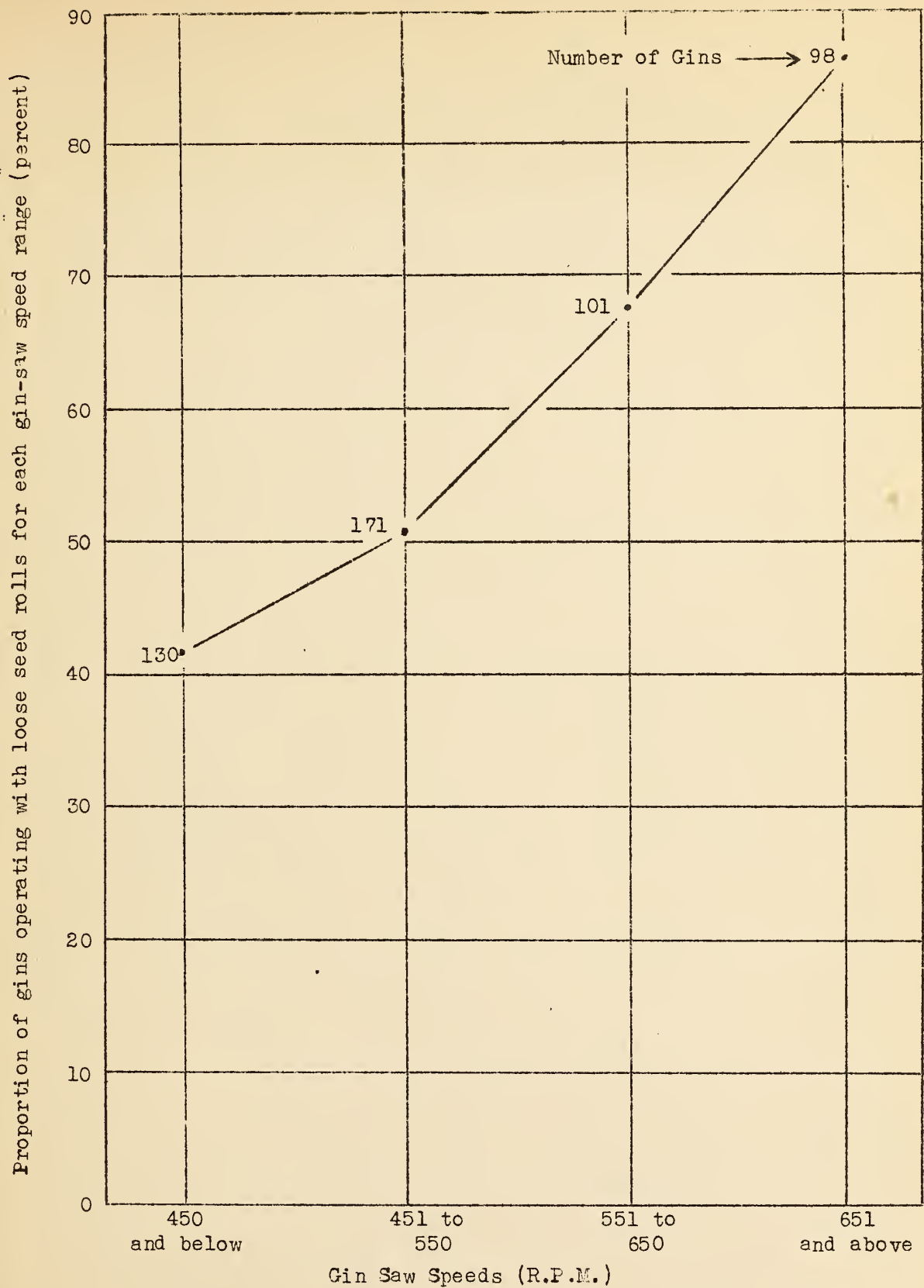


FIGURE 2.- RELATIONSHIP OF SEED-ROLL DENSITY TO GIN-SAW SPEED OF REPRESENTATIVE COMMERCIAL GINS IN THE UNITED STATES, SEASON 1940

in Oklahoma. Messrs. Ellithorp and McPheters are always pleased to work with ginners on their problems, and they already have made good progress in this work. However, they and we realize that there is opportunity for making much more improvement through the cooperative efforts of Oklahoma ginners and Oklahoma extension workers.

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